

N<sup>o</sup> 2014



A.D. 1914

Date of Application, 26th Jan., 1914—Accepted, 21st May, 1914

COMPLETE SPECIFICATION.

**Improvements in Housings for the Conning Tower, Periscopes and Ventilating Shafts of Submarines.**

I, MARLEY FOTHERINGHAM HAY, of 1, Crown Gate, in the City and County of Glasgow, North Britain, Naval Architect, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention has for its object to provide improved housings for the conning tower and the periscopes of submarines and if desired also for the ventilating shafts of such vessels, so as to materially reduce the resistance produced by these projecting parts when the vessel is running submerged. Thus in view of  
10 this decreased resistance the speed of the vessel submerged for any given power is increased, and the radius of action submerged for any given speed is considerably enhanced.

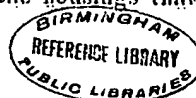
It has always been a general practice in submarines to fit a conning tower for purposes of observation and navigation when running on the surface in rough weather. This conning tower is usually circular in section or some other form  
15 which is productive of a large amount of resistance to propulsion when the vessel is submerged. With a view to somewhat decreasing this resistance it has likewise been a general practice to fit a housing forming a wave breaker or "fairwater" around this conning tower giving it a more or less ship shape form. This fairwater, however, has been made lower than the conning tower itself, and  
20 the top of the conning tower which is provided with port holes for purposes of observation has projected above the top of the fairwater. This projecting top is in itself, however, productive of a very large amount of resistance. To overcome or materially decrease this resistance according to the first part of the invention there is provided an improved form of wave breaker in which the after  
25 portion is carried up to a height corresponding with the height of the conning tower. By this means the resistance of the projecting portion of the conning tower is reduced to a minimum.

This after portion of the housing is covered over and forms a usual navigating platform when running on the surface in fair weather.

30 The usual two periscopes pass up through the housing, and according to the second part of the invention a considerable portion of the parts of these periscopes which extend above the housing are enclosed in a single additional housing tapered to a vertical edge at both ends and extending up from the navigating platform as high as may be convenient or possible. "Dead water" is thus prevented from forming behind the rounded after side of each periscope, and consequently the resistance these parts formerly produced is materially reduced.

The space in both housings between the periscopes can be utilised as a convenient lead for the ventilating shafts, and where such shafts are fitted with the improved system of valves, forming the subject-matter of a concurrent Application for a Patent No. 2015 of 1914, so that they do not require to be pulled  
40 down preparatory to diving they are also so enclosed by the housings that the

[Price Set.]



*Housings for the Conning Tower, Periscopes and Ventilating Shafts of Submarines.*

resistance they would otherwise offer is obviated. Consequently as the ventilating shafts do not require to be pulled down preparatory to diving, the time required to prepare the vessel for diving is thereby materially reduced.

The improved housings are shown on an accompanying sheet of explanatory drawings, Figure 1 being an end elevation, Figure 2 a side elevation, and Figure 3 a plan thereof.

As shown in the drawings the conning tower A is surrounded by a housing B forming a wave breaker or fairwater. This housing is on its forward side carried up from the vessel's superstructure C as formerly, only to a level which is below the level of the sidelights on the side of the conning tower, to allow a direct line of vision being obtained ahead through the sidelights; but according to the invention the after portion of the housing B is made to extend up to the full height of the conning tower A and it is tapered and ends in a fine vertical edge. Thus the resistance offered by the conning tower A when the vessel is under way submerged is reduced to a minimum.

The usual two periscopes D, E also project up through the after portion of the housing B the top of which is covered over and forms a navigating platform, and an additional single housing G tapered to a vertical edge at both ends and extending up from the navigating platform as high as may be possible or convenient, so encloses a considerable portion of the upwardly extending parts of these periscopes that the resistance formerly offered by them when the vessel is under way submerged is reduced to a minimum.

Further, two ventilating shafts H, J, each fitted with the improved system of valves hereinbefore referred to, so that they do not require to be pulled down previous to diving, are so led that they extend up through both housings B, G and, as they are therefore similarly sheathed or enclosed by the housings so that dead water is also prevented from forming behind their rounded after sides, they offer little or no resistance to the propulsion of the vessel submerged, and consequently there is no objection to their being left in position and not drawn down preparatory to diving.

The usual apertures are also provided in both housings to permit of the entry and exit of water and air to their interiors when diving, so that these structures do not require to be made pressure resisting.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

Improved housings for the conning tower, periscopes, and if desired the ventilating shafts of submarines, the housing for the conning tower being of usual height on its forward side but on its after side extended up to the full height of the conning tower and tapering to a fine rear edge; this housing having on it a second single housing enclosing upwardly extending portions of the periscopes and ventilating shafts, this single housing being tapered to a vertical edge at both ends, thus "dead water" cannot form behind the parts so sheathed and they offer little or no resistance to the propulsion of the vessel submerged.

Dated this Twenty-fourth day of January, 1914.

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HAY'S COMPLETE SPECIFICATION.

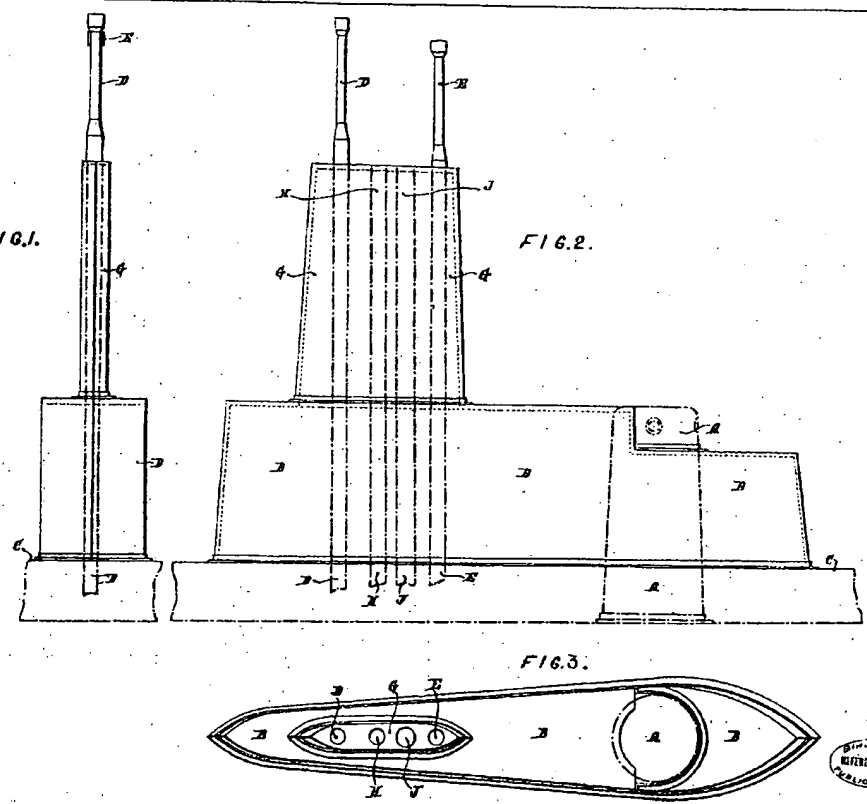
[ 1 SHEET ]

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FIG. 1.

FIG. 2.

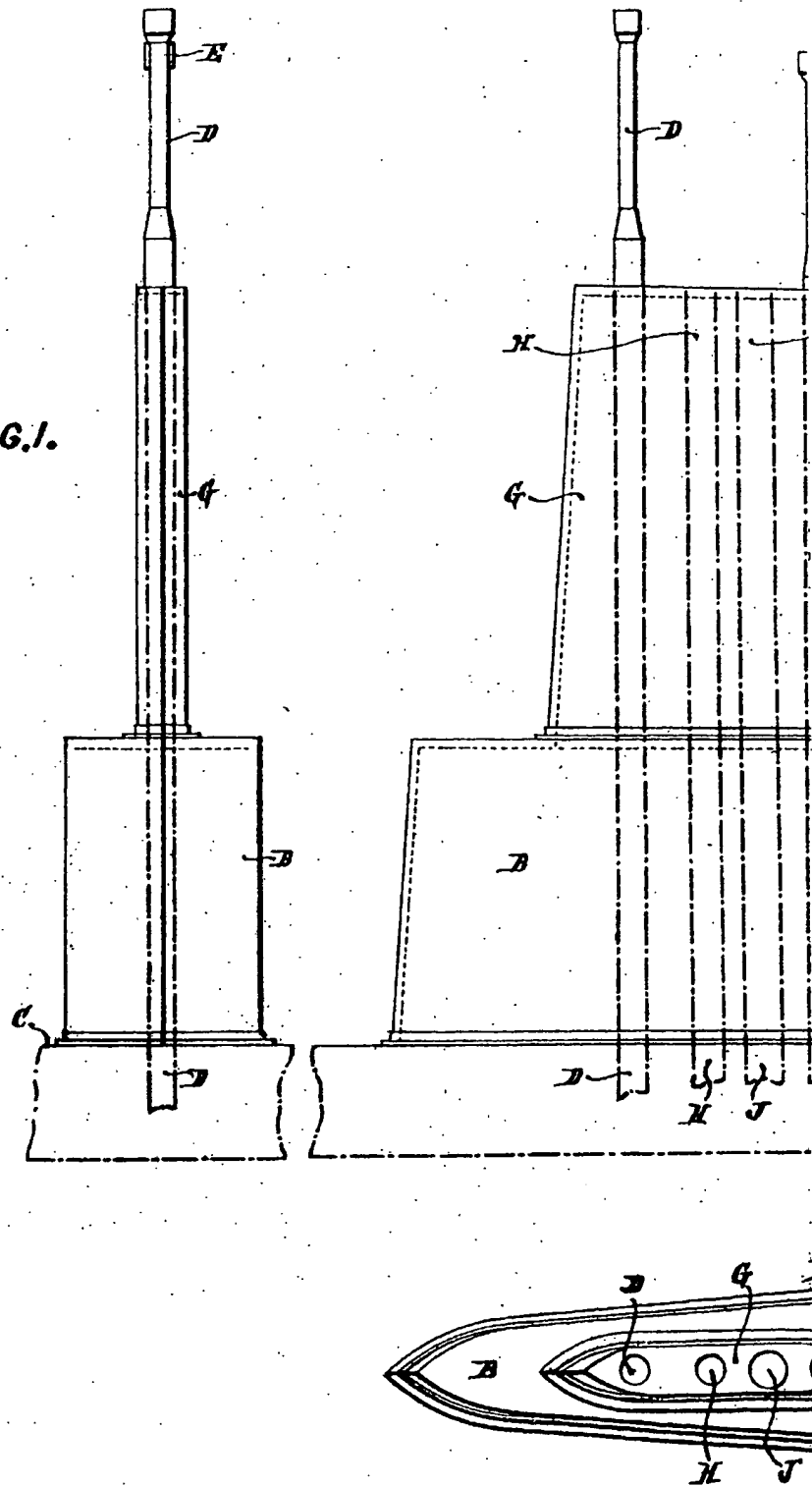
FIG. 3.



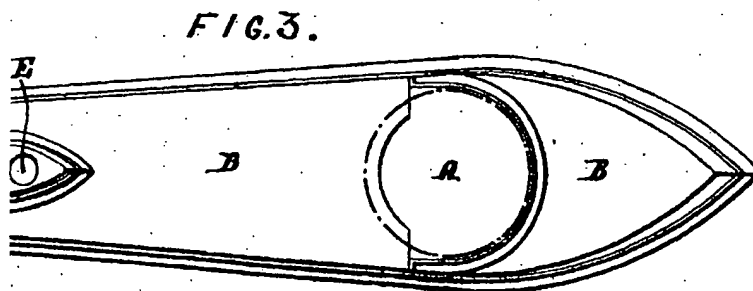
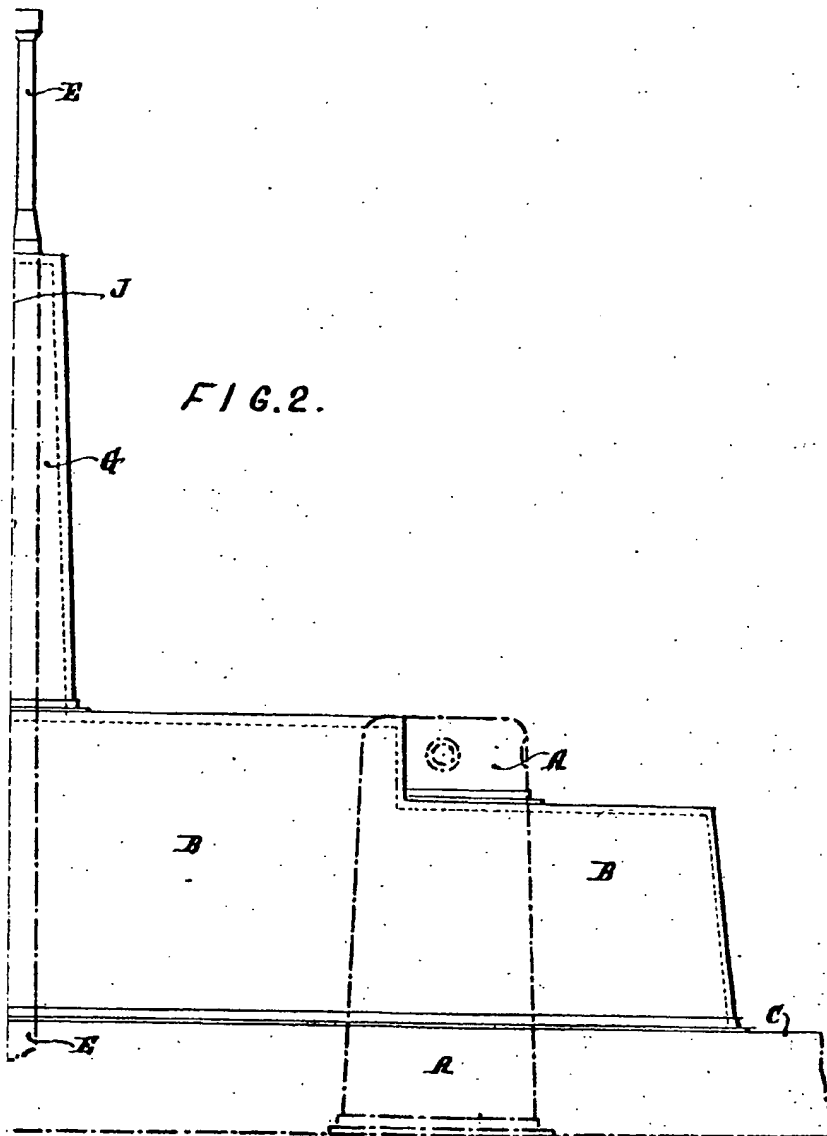
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*[This Drawing is a reproduction of the Original on a reduced scale.]*

FIG. 1.



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